

STUDIES IN THE THEACEAE, XXI  
THE SPECIES OF THEACEAE INDIGENOUS TO THE  
UNITED STATES

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*With four text-figures*

SINCE THE FAMILY THEACEAE is known to prefer the tropical and subtropical regions of the world, one may expect to find only a small representation of the family in the United States — and these select few on the very fringe of our limited subtropical range.

There are three genera, *Stewartia*, *Gordonia*, and *Franklinia*, found in this country, and these are represented by four species, two being allotted to the genus *Stewartia*. *Franklinia* is monotypic and American. *Stewartia* and *Gordonia*, on the other hand, are primarily tropical Asiatic genera.

In Index Kewensis twenty names have been allotted to *Stewartia*, eleven of which are in roman type signifying accepted species. *Gordonia* shows eighty names, over fifty of which appear as accepted species. Neither of these two genera has ever been thoroughly studied as a whole, and it is quite likely that in a future detailed study the reduction in the number of species will be considerable. It is the intention of this author to devote considerable time shortly to these Asiatic representatives. However, for this study the oriental species were considered only generally and are not included here. No matter what a further study of the groups reveals, the names given in this paper will survive for these genera, since the original descriptions of all three were based on American material.

The four species recorded in this study appear to be very well known, and, as the citation of the literature which follows attests, have appeared often in print. A wealth of material has been made available by the various institutions recorded below. The abbreviations used in this paper are as follows: (AA) = Arnold Arboretum; (Ch) = Chicago Natural History Museum; (G) = Gray Herbarium; (Mo) = Missouri Botanical Garden; (NY) = New York Botanical Garden; and (US) = United States National Museum.

In keeping with my practice in previous papers, I am including as complete a citation of literature for the species as has been available to me at the Arnold Arboretum. Actually this is by no means complete, since new references, sometimes in obscure publications, are being encountered daily. However, I have tried to include all the more available works.

A noticeable contrast may be noted in the literature cited for the genera. More complete citations will be given in the following papers, when the Asiatic material is studied in detail. The Asiatic synonyms were checked in this paper only to ascertain their relationships with the accepted genera.

As to specimens, well over four hundred have been studied. I have included most of these, reducing the space occupied by the citations as much as possible by omitting all details except the general locality, the collector and number, and the herbaria where the specimens are deposited.

#### KEY TO THE GENERA

- A. Seeds prolonged into a pronounced oblong wing at one end; foliage coriaceous, persistent.....1. *Gordonia*.  
 AA. Seeds wingless (a light membranaceous margin in *Stewartia ovata*); foliage membranaceous, deciduous.  
 B. Capsule dehiscing loculicidally from above and septicidally from below; columella present, persistent.....2. *Franklinia*.  
 BB. Capsule dehiscing loculicidally from above only, no basal dehiscence; columella absent.....3. *Stewartia*.

#### 1. GORDONIA Ellis

**Gordonia** Ellis in Phil. Trans. London 60: 518, *t.* 11. 1771.

*Antheïschima* Korthals, Verh. Nat. Gesch. Bot. ed. Temminck 137, *t.* 27. 1840.

*Carria* Gardner in Calcutta Jour. Nat. Hist. 7: 7. 1847.

*Dipterospermum* Griffith, Notulae Pl. Asiaticas 4: 564. 1854.

*Polyspora* Sweet, Hort. Brit. ed. 1, 61. 1861.

*Nabiasodendron* Pitard in Act. Soc. Linn. Bordeaux 57: liv. 1902.

TYPE SPECIES: *Gordonia Lasianthus* (L.) Ellis.

Flowers hermaphroditic with a light convex receptacle. Sepals 5, coriaceous, unequal, often gradually grading into the petals, usually deciduous, occasionally persistent. Petals 5, deciduous, joined at the base. Stamens numerous; filaments long, joined at the base and adnate to the base of the corolla, rarely united at the base in a ring-like shallow-lobed cup; anthers introrse. Ovary 3–5 (rarely 6)-celled, with several ovules in each cell; style one, either long or short, with a 3–5-lobed stigma. Capsule woody, with a persistent columella, dehiscing loculicidally from the apex. Seeds 2–8 in each cell, flat or compressed, the woody testa produced upwards into an elongated, usually oblong wing.

Trees or shrubs with alternate coriaceous persistent leaves. Flowers large, solitary, axillary with 2–5 caducous bracts.

**Gordonia Lasianthus** (L.) Ellis in Phil. Trans. London 60: 518, *t.* 11. 1771. — Linnaeus, Mant. 550. 1771. — Cavanilles, Diss. Bot. 5: 307, *t.* 161. 1787. — Walter, Fl. Carol. 177. 1788. — Lamarck, Encycl. Meth. Bot. 2: 770. 1788. — L'Heritier, Stirp. Nov. 156. 1791. — Swartz, Obs. Bot. 271. 1791. — Lamarck, Ill. 3: *t.* 594. 1797. — Willdenow, Spec. Pl. 3: 840. 1800. — Michaux, Fl. Amer.-Bor. 2: 42. 1803; ed. 2, 2: 42. 1820. — Sims in Curtis's Bot. Mag. 17: *t.* 668. 1803. — Duhamel, Arb. & Arbust. ed. 2, 2: 236, *t.* 68. 1804. — Desfontaines, Hist. Arb. 1: 484. 1809. — Dumond-Courset, Bot. Cult. ed. 2, 5: 107. 1811. — Michaux f., Hist. Arb. For. Amér. Sept.

3: 131, *t.* 1. 1813. — Pursh, *Fl. Amer. Sept.* 1: 451. 1814. — Nuttall, *Gen. N. Amer. Pl.* 2: 84. 1818. — Eaton, *Man. Bot.* ed. 1, 78. 1817. — Michaux, *N. Amer. Sylva* 2: 138, *t.* 58. 1818. — Elliot, *Sketches Bot.* 2: 171. 1822. — Reichenbach, *Fl. Exot.* 3: *t.* 151. 1835. — De Candolle, *Prodr.* 1: 528. 1824. — Colla, *Hort. Repul.* 62. 1824. — G. Don, *Gen. Syst.* 1: 573, *fig.* 99. 1831. — J. C. Loudon, *Arb. & Fruct. Brit.* 1: 379, *fig.* 93. 1838. — Torrey & Gray, *Fl. N. Amer.* 1: 223. 1838. — Gray, *Gen. Ill.* 2: 102, *t.* 140, 141. 1849. — Darby, *Bot. S. States* 256. 1855. — Choisy in *Mém. Soc. Phys. Hist. Nat. Genève* 14: 139 (*Mém. Ternstr.* 51). 1855. — Chapman, *Fl. South. U. S.* ed. 1, 60. 1860. — Curtis, *Geol. & Nat. Hist. Surv. N. Carol.* 3: 14. 1867. — Baillon, *Hist. Pl.* 4: 230, *fig.* 254, 255. 1873. — Loudon, *Trees & Shrubs* 73, *fig.* 110. 1875. — Goodale & Sprague, *Wild Fl. Amer.* 194. 1882. — Sargent, *Forest Trees N. Amer.* 10th Census 9: 25. 1884. — Baillon, *Dict. Bot.* 2: 725, *fig.* 1886. — Watson & Coulter in *Gray's Man. Bot. North U. S.* ed. 6, 96. 1890. — Sargent, *Silva N. Amer.* 1: 41, *t.* 21. 1891. — Szyszyłowicz in *Nat. Pflanzenfam.* III. 6: 185, *fig.* 93. 1893. — Dippel, *Handb. Laubholzk.* 3: 32, *fig.* 20. 1893. — Koehne, *Deutsche Dendrol.* 414. 1893. — Gray, *Syn. Fl. N. Amer.* 1: 293. 1897. — De Wildeman,  *Ic. Selectae Hort. Thenensis* 2: *t.* 41. 1900. — Lounsberry, *South. Wild Fl. & Trees* 338, *t.* 107. 1901. — Small, *Fl. SE U. S.* 794. 1903; ed. 2, 1913. — Sargent, *Man. Trees N. Amer.* 678, *fig.* 553. 1905. — Hough, *Handb. Trees N. States & Canada* 352. 1907. — Britton & Shafer, *N. Amer. Trees* 705, *fig.* 650. 1908. — Robinson & Fernald in *Gray's Man. Bot.* ed. 7, 571. 1908. — Schneider, *Ill. Handb. Laubholzk.* 330. 1909. — Apgar, *Orn. Shrubs U. S.* 80, *fig.* 52. 1910. — Bean, *Trees & Shrubs Hardy Brit. Isles* 1: 597. 1914; ed. 3, 1921. — Rehder in *Bailey, Stand. Cyclop. Hort.* 3: 1361. 1915. — Bailey, *Man. Cult. Pl.* 501. 1924; ed. 2, 673. 1949. — Melchior in *Nat. Pflanzenfam.* ed. 2, 21: 137, *fig.* 63. 1925. — Rehder, *Man. Cult. Trees & Shrubs*, ed. 1, 624. 1927. — Small, *Man. SE Fl.* 877, *fig.* 1933.

*Hypericum Lasianthus* Linnaeus, *Spec. Pl.* 783. 1753; ed. 2, 1101. 1762. — Hill, *Veg. Syst.* 15: *t.* 1, *f.* 3. 1769.

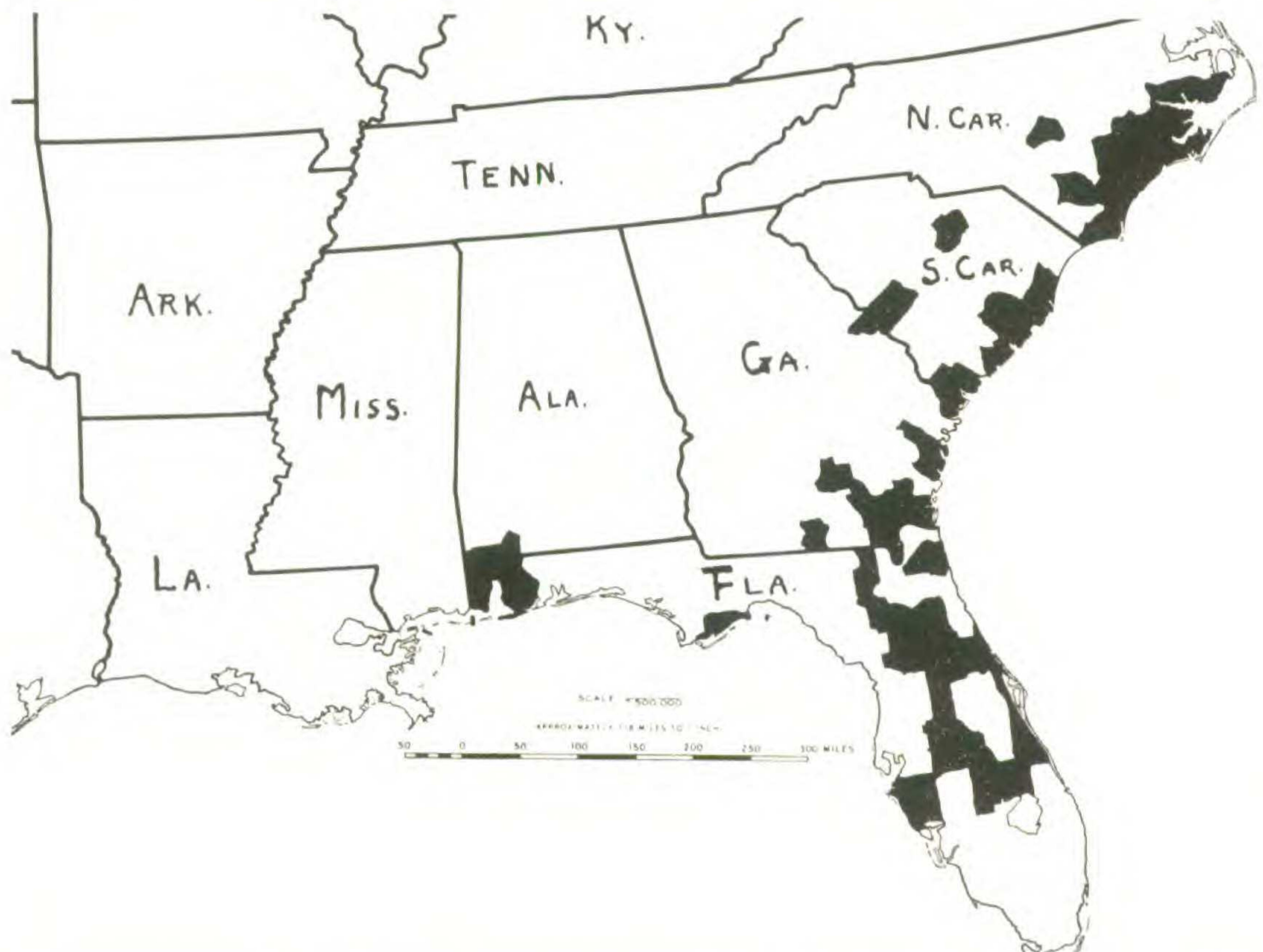
*Alcea Floridana quinque capsularis, Laurinis foliis, leviter crenatis, seminibus coniferarum instar alatis* Catesby, *Nat. Hist. Car. Fla. & Bah. Islands* 1: 44, *t.* 44. 1754.

*Gordonia pyramidalis* Salisbury, *Prodr. Stirp. Chap. Allert.* 386. 1796.

*Lasianthus pyramidalis* (Salisbury) O. Kuntze, *Rev. Gen. Pl.* 1: 63. 1891.

Tree 20–30 m. high (occasionally a shrub); the trunk straight 0.4–0.5 m. in diam.; branches upright at first, then spreading forming a compact head; bark of mature tree brown, as much as 2.5 cm. thick, deeply divided into ridges. Leaves coriaceous, persistent, glabrous, lanceolate to oblong-lanceolate to elliptic, 10–15 cm. long, 2.5–5 cm. wide, acute at the apex, cuneate near the base, then long-decurrent (1.5 cm.) to the sessile or subsessile base, the margin serrate along the upper half of the leaf, rarely below the middle, the midrib lightly canaliculate above, elevated beneath,

the veins up to 15 pairs, rather inconspicuous. Flowers solitary, axillary; pedicel terete, glabrous, red, 5–8 cm. long, thickening toward the apex; bracteoles 4, below calyx, quickly caducous; calyx-lobes 5, imbricate, subcoriaceous, deciduous, orbicular to suborbicular, ca. 1 cm. long, densely covered on external surface with a dense velvety pale lustrous pubescence, the margin ciliate with long pale hairs; petals 5, white, incurved, rounded at the apex, contracted at the base, ca. 3 cm. long, 1.5–2.5 cm. wide, silky-puberulent on the exterior surface; stamens numerous, the filaments united at the base, forming a shallow deeply 5-lobed cup, pubescent on the inner surface and adnate to the base of the corolla, the free part of the filaments ca. 5 mm. long; ovary ovoid, pubescent, gradually contracted into a stout persistent style, 5-celled, the ovules 4–8 in each cell, the style elongated, erect, the stigma 5-lobed. Capsule subligneous, ovoid, acute at the apex, 1.5–2 cm. long, ca. 1 cm. diameter, 5-celled, dehiscing loculicidally with a persistent angled central axis. Seeds winged at one end, ca. 1 cm. long, slightly concave on the inner surface, concave on the outer surface.



TEXT-FIGURE I. Geographical distribution of *Gordonia Lasianthus* (L.) Ellis by counties, based on the herbarium specimens studied.

**SPECIMENS EXAMINED:**

NORTH CAROLINA: BEAUFORT Co.: *R. K. Godfrey* 5399 (G).  
 BLADEN Co.: *W. W. Ashe* 2396 (NY), *s. n.* (Mo, US); *R. K. Godfrey* 5977 (G); *A. A. Heller* 14091 (Ch, Mo); *H. J. Oosting & H. L. Blomquist* 33647 (G). BRUNSWICK Co.: *E. B. Bartram s. n.* (G); *K. M. Wiegand &*

*W. E. Manning* 1978 (G). CARTERET Co.: *C. V. Morton* 2206 (US); *L. F. & F. R. Randolph* 836 (G). CRAVEN Co.: *T. G. Harbison* 22 (AA). DUPLIN Co.: *M. E. Hyams s. n.* (US). HARNETT Co.: *L. R. Gibbs s. n.* (NY). HYDE Co.: *P. O. Schallert s. n.* (NY). LENOIR Co.: *L. F. & F. R. Randolph* 790 (G). NEW HANOVER Co.: *Biltmore Herb.* 3908 (AA, G, Mo, NY, US); *R. K. Godfrey* 4678 (G, NY, US). ONSLOW Co.: *H. L. Blomquist* 11276 (Mo). PAMLICO Co.: (*M.*) *G. McCarthy s. n.* (Ch, US). PRECISE LOCALITY LACKING: *W. H. Brown s. n.* (US); (*M.*) *G. McCarthy s. n.* (Ch, G, US).

SOUTH CAROLINA: AIKEN Co.: *H. Eggert s. n.* (Mo). BEAUFORT Co.: *J. H. Mellichamp s. n.* (AA, Mo, US); *J. H. Ravenel s. n.* (G). BERKELEY Co.: *K. M. Wiegand & W. E. Manning* 1979 (G). CHARLESTON Co.: *F. C. Prince s. n.* (G). GEORGETOWN Co.: *R. K. Godfrey & R. M. Tryon* 673 (G, Mo, NY, US). KERSHAW Co.: *S. D. McKelvey s. n.* (AA). JASPER Co.: *C. Mohr s. n.* (Mo, US).

GEORGIA: BRANTLEY Co.: *E. T. Wherry s. n.* (AA, G). CAMDEN Co.: *R. M. Harper* 1571 (AA, Ch, G, Mo, US). CHARLTON Co.: *F. Harper s. n.* (US); *N. Hotchkiss & L. E. E.* 3386 (US). COFFEE Co.: *R. M. Harper* 693 (NY, US). LIBERTY Co.: *T. G. Harbison s. n.* (AA); *J. K. Small s. n.* (NY). LOWNDES Co.: *J. K. Small s. n.* (AA, NY). McINTOSH Co.: *T. G. Harbison* 5935 (AA); *H. H. Smith* 2804 (Ch). RICHMOND Co.: *A. Curtiss s. n.* (NY); *J. D. Smith s. n.* (G, US). WARE Co.: *Helbard Cypress Co. s. n.* (AA, Mo).

FLORIDA: ALACHUA Co.: *T. G. Harbison* 90 (AA). BREVARD Co.: *A. S. Rhoads* 8336 (AA). COLUMBIA Co.: *A. H. Hitchcock s. n.* (Ch); *J. E. Layne* 16 (Mo). DUVAL Co.: *A. H. Curtiss* 405 (AA, Ch, G, Mo, NY, US), 4884 (AA, G, Mo, US), 9964 (Mo), *s. n.* (Ch, US); *H. D. Keeler s. n.* (NY). FRANKLIN Co.: *T. Drummond* 10 (G). HIGHLANDS Co.: *T. G. Harbison* 49 (AA); *J. B. McFarlin* 8433 (AA, US). INDIAN RIVER Co.: *Ed. Palmer* 51 (Ch, Mo, US); *J. K. Small* 8896 (NY). LAKE Co.: *A. H. Hitchcock s. n.* (Ch, Mo, NY); *G. V. Nash* 2089 (Ch, G, Mo, US); *H. J. Webber* 451 (Mo). MANATEE Co.: *J. H. Simpson* 50 (Ch, US). MARION Co.: *C. D. Mell* 125 (Ch). SARASOTA Co.: *C. H. M. Barrett* 23 (US). OKEECHOBEE Co.: *J. K. Small, N. L. Britton, E. G. Britton & J. B. De Winkeler* 9249 (US). POLK Co.: *P. O. Schallert s. n.* (G, Mo). PUTNAM Co.: *G. B. Sudworth s. n.* (US). VOLUSIA Co.: *S. C. Hood s. n.* (G, Mo). PRECISE LOCALITY LACKING: *S. B. Buckley s. n.* (Mo, NY); *A. W. Chapman s. n.* (NY); *H. Cooper s. n.* (NY); *A. H. Howell* 1142 (US); *C. Mohr s. n.* (NY, US).

ALABAMA: BALDWIN Co.: *J. G. Jack* 3070 (AA). MOBILE Co.: *C. Mohr s. n.* (US).

This species, the sole American representative of a somewhat sizable genus which otherwise inhabits the Asiatic tropics, is very well known in both wild and cultivated states. It can be separated easily from all other American species of the family by its coriaceous persistent leaves and the rather long-oblong winged seeds from woody capsules.

In distribution it appears to be confined to the coastal plain areas extending from North Carolina south through South Carolina, Georgia, Florida, and briefly into the southern part of Alabama.

## 2. FRANKLINIA Marshall

**Franklinia** Marshall, Arbust. Amer. 48. 1785. — J. F. Gmelin, Syst. Nat. ed. 13, 2: 810. 1791. — Melchior in Nat. Pflanzenfam. ed. 2, 21: 134. 1925.

*Michauxia* Salisbury, Prodr. Stirp. Chap. Allert. 386. 1796. Non L'Heritier 1788, nec Necker 1791.

*Lacathea* Salisbury in W. Hooker, Paradis. Londin. t. 56. 1806.

TYPE SPECIES: *Franklinia alatamaha* Marshall.

Flowers hermaphroditic. Sepals 5, imbricate, deciduous, suborbicular, coriaceous, unequal. Petals 5, membranaceous, obovate, crenulate. Stamens numerous; filaments free, adnate to the base of the corolla. Ovary rounded, truncate at the apex, conspicuously ridged, 5-celled; styles connate, slender, deciduous; stigma 5-lobed. Capsule subglobose, woody, 5-valved, dehiscing loculicidally from above, septicidally below with a persistent central axis. Seeds 6–8 in each cell, closely packed, wingless.

Shrubs or small trees with alternate, remotely serrulate deciduous leaves. Flowers large and showy, subsessile, axillary, solitary, with two quickly caducous bracts below the calyx.

**Franklinia alatamaha** Marshall, Arbust. Amer. 49. 1785. — Bartram, Trav. 16, 467. 1791. — Small, Fl. SE U. S. 793. 1903; ed. 2, 1913; Man. SE Fl. 876, fig. 1933. — Britton & Shafer, N. Amer. Trees 704, fig. 649. 1908. — Melchior in Nat. Pflanzenfam. ed. 2, 21: 135. 1925. — Wherry in Jour. Washington Acad. Sci. 18: 172–176. 1928. — Harper & Leeds in Bartonia 19: 1–13, fig. 1937. — Rehder, Man. Cult. Trees & Shrubs ed. 2, 636. 1940; Bibl. Cult. Trees & Shrubs 461. 1949. — Bailey, Man.-Cult. Pl. ed. 2, 673. 1949.

*Gordonia pubescens* Cavanilles, Diss. Bot. 5: 308, t. 162. 1787. — Lamarck, Encycl. Meth. Bot. 2: 770. 1788. — L'Heritier, Stirp. Nov. 156. 1791. — Michaux, Fl. Amer.-Bor. 2: 42. 1803; ed. 2, 2: 42. 1820. — Ventenat, Jard. Malmaison t. 1. 1803. — Duhamel, Arb. & Arbust. ed. 2, 2: 237. 1804. — Desfontaines, Hist. Arb. 1: 484. 1809. — Dumond-Courset, Bot. Cult. ed. 2, 5: 107. 1811. — Michaux f., Hist. Arb. For. Amér. Sept. 3: 135, t. 2. 1813. — Pursh, Fl. Amer. Sept. 1: 451. 1814. — Michaux, N. Amer. Sylva 2: 140, t. 59. 1818. — Mordant de Launay, Herb. Gén. Amateur, sér. 1, 4: t. 236. 1820. — Elliot, Sketches Bot. 2: 171. 1822. — De Candolle, Prodr. 1: 528. 1824. — Drapiez, Herb. Amateur Fl. 3: t. 573 [265]. 1829. — G. Don, Gen. Syst. 1: 573. 1831. — J. C. Loudon, Arb. & Fruct. Brit. 1: 381, fig. 94. 1838. — Torrey & Gray, Fl. N. Amer. 1: 223. 1838. — Gray, Gen. Ill. 2: 102, t. 141, 142. 1849. — Darby, Bot. S. States 257. 1855. — Choisy in Mém. Soc. Phys. Hist. Nat. Genève 14: 139 (Mém. Ternstr. 51). 1855. — Chapman, Fl. South. U. S. ed. 1, 60. 1860. — Loudon, Trees & Shrubs 73, fig. 111. 1875. — Goodale & Sprague, Wild Fl. Amer. 193, t. 47. 1882. — Sargent, Forest Trees N. Amer. 10th Census 9: 25. 1884. — Szyszyłowicz in Nat. Pflanzenfam. III. 6: 185. 1893. — Gray, Syn. Fl. N. Amer. 1: 293. 1897. — Rehder in Möller's Deutsche Gärtn.-Zeit. 14: 25. 1899. — Keeler, Our North. Shrubs 33, t. 1903; ed. 2, 1912. — Apgar, Orn. Shrubs U. S. 80, fig. 53. 1910. —

Bean, Trees & Shrubs Hardy Brit. Isles 1: 597. 1914; ed. 3, 1921.  
— Mathews, Field Book Amer. Trees & Shrubs 329, *fig.* 1915.

*Gordonia Franklini* L'Heritier, Stirp. Nov. 156. 1791. — Willdenow, Spec. Pl. 3: 841. 1800. — Duhamel, Arb. & Arbust. ed. 2, 2: 237. 1804. — Desfontaines, Hist. Arb. 1: 484. 1809. — Eaton, Man. Bot. ed. 1, 78. 1817, as "*G. franklinia*."

*Franklinia americana* J. F. Gmelin, Syst. Nat. ed. 13, 2: 810. 1791.

*Michauxia sessilis* Salisbury, Prodr. Stirp. Chap. Allert. 386. 1796.

*Lacathea florida* Salisbury in W. Hooker, Paradis. Londin. 1: t. 56. [1806]. — Colla, Hort. Repul. (Append. i) 134. 1824.

*Gordonia pubescens* Cavanilles  $\alpha$  *velutina* De Candolle, Prodr. 1: 528. 1824. — G. Don, Gen. Syst. 1: 573. 1831.

*Gordonia pubescens* Cavanilles  $\beta$  *subglabra* De Candolle, Prodr. 1: 528. 1824. — G. Don, Gen. Syst. 1: 573. 1831.

*Franklinia alatama* Rafinesque in First Cat. Bot. Gard. Transylv. Univ. 21. 1824, *nom.*; Atlantic Jour. 1: 79, *fig.* 1832.

*Gordonia Altamaha* (Marshall) Sargent in Gard. & For. 2: 616. 1889; Silva N. Amer. 1: 45, t. 22. 1891. — Dippel, Handb. Laubholzk. 3: 31, *fig.* 19. 1893. — Lounsberry, South. Wild Fl. & Trees 338, t. 108. 1901. — Sargent, Man. Trees N. Amer. 679, *fig.* 554. 1905. — Schneider, Ill. Handb. Laubholzk. 329, *fig.* 219. 1909. — Silva Tarouca, Freil.-Laubgeh. 229. 1913. — Rehder in Bailey, Stand. Cyclop. Hort. 3: 1361. 1915; Man. Cult. Trees & Shrubs 636. 1927. — Bailey, Man. Cult. Pl. 501. 1924.

*Lasianthus pubescens* (L'Heritier) O. Kuntze, Rev. Gen. Pl. 1: 63. 1891.

Tree 5–7 m. high, the bark thin, smooth, dark brown; branches glabrous, stout, slightly angled, dark reddish brown. Leaves membranaceous, obovate to oblong-obovate, 12–18 cm. long, 5–7 cm. wide, occasionally up to 25 × 9.5 cm.; acute at the apex, long-tapering at the base, when young the under surface densely covered with a light grayish mixed pubescence of long hairs and matted short tufted or stellate hairs, at maturity glabrescent with only occasional hairs of each type, bright green above, paler beneath, the midrib canaliculate above, elevated beneath, the veins 10–12 pairs, conspicuous on both surfaces, the margin remotely serrate, usually to below the middle, occasionally nearly to the base. Flowers solitary, axillary in the axes of crowded upper leaves, appearing in late September (Boston); pedicel very short, stout, terete, densely pubescent at first, glabrescent; bracteoles 2, quickly caducous; calyx-lobes 5, imbricate, deciduous, suborbicular, 1–1.5 cm. long, ciliate at the margins, densely covered with appressed-tufted hairs on the exterior surface; petals 5, white, membranaceous, obovate, large, up to 6 cm. long, 4 cm. wide, usually smaller, crenulate along the margin, densely pubescent on the exterior surface, the outer petal usually smaller and more incurved; stamens numerous, the filaments free, adnate to the base of the corolla, 1–1.5 cm. long; ovary rounded, densely pubescent, conspicuously ridged, truncate or nearly so at the apex, 5-celled, the style slender, as long as the stamens, deciduous, the stigma 5-lobed. Capsule globose, woody, 5-celled, splitting loculicidally from the apex to the middle and septicidally from the base to the middle,

giving a rick-rack appearance, maintaining contact after dehiscence at the center with the deeply grooved central axis. Seeds 6–8, closely packed, ca. 1 cm. long, wingless.

SPECIMENS EXAMINED:

CULTIVATED ONLY:

MASSACHUSETTS: ARNOLD ARBORETUM: *C. E. Faxon* (AA, G); *J. G. Jack* (AA); *C. E. Kobuski* (AA); *C. E. Kobuski & E. F. Roush* (AA); *E. J. Palmer* (AA); *A. Rehder* (Mo); *W. A. Setchell* (Mo).

PENNSYLVANIA: Hort. Bartram Gard., Philadelphia, *C. E. Smith* (US); Collector unknown (Mo). Hort. T. Meehan, Philadelphia, *C. E. Faxon* (G); Collector unknown (AA). Hort. Laurel Hill, Philadelphia, *Miss Morris* (G). Hort. John Evans Garden, Delaware Co., *T. C. Porter* (Ch).

MARYLAND: Hort. Chevy Chase, *F. V. Coville* (US); *P. L. Ricker* (Mo).

WASHINGTON, D. C.: Hort. Saul's Nursery (1881–1882) *L. F. Ward* (US); *G. Vasey* (US); Hort. Congressional Garden, *C. C. Parry* (US); Hort. Lafayette Sq., *A. Schott* (Ch); *G. B. Sudworth* (US). Precise locality lacking, *G. B. Sudworth* (AA); *G. Vasey* (Mo, US).

MISSOURI: Hort. Shaw's Garden, *G. Engelmann* (Mo); "St. Louis," *E. E. Sherff* (Ch).

FRANCE: Hort. Les Barres (French Nat. Arb.), Nancy, *C. K. Schneider* (AA).

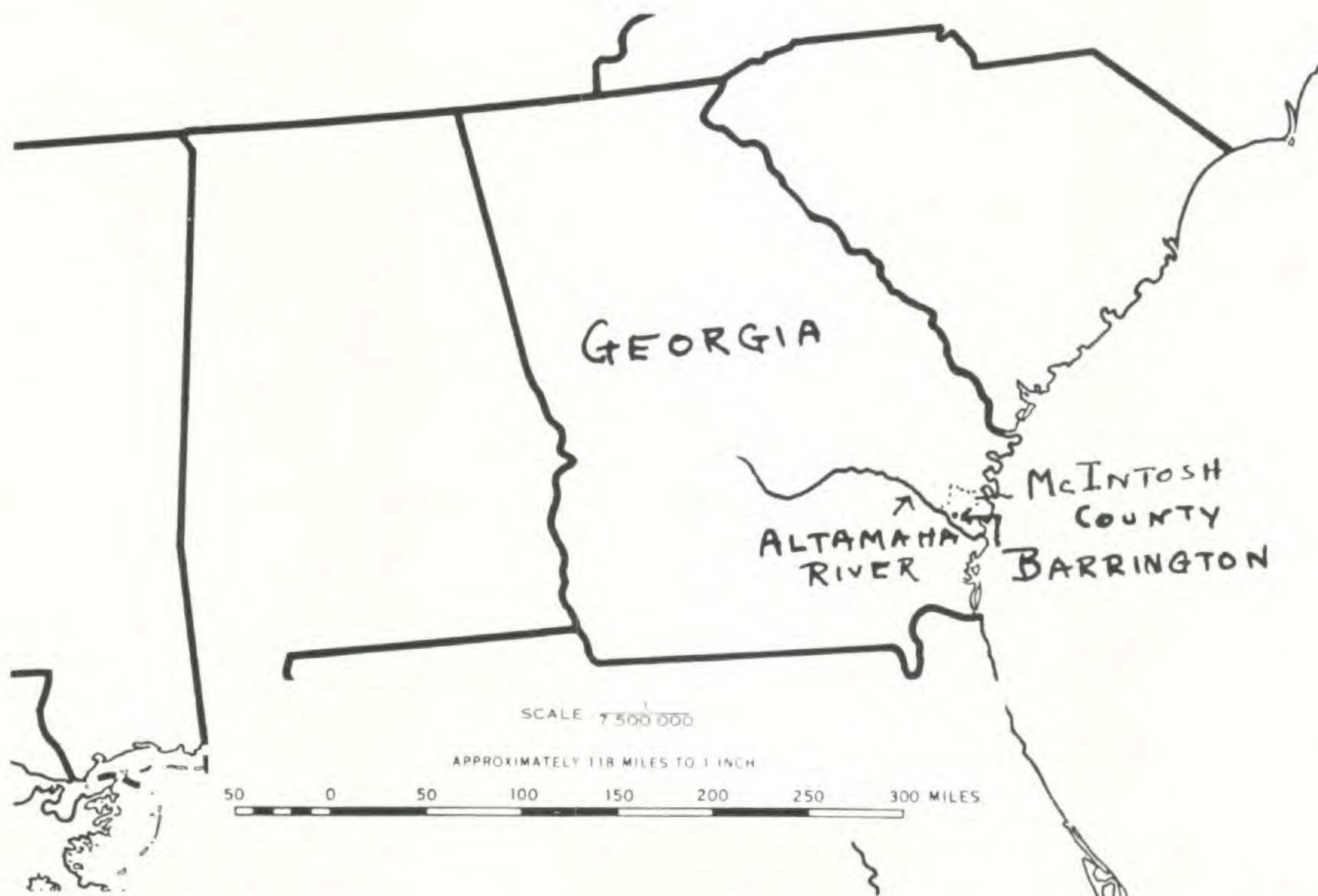
Except perhaps for the genus *Camellia*, it appears that more research and study have been devoted to this single species than to any other member of the family. Why? Certainly not for its beauty! It is an attractive tree, true enough, with an interesting late period of flowering, but no more attractive nor hardy than the other species of this family found in our gardens.

Its history is interesting to a degree! It seems that the species was first observed by John Bartram in 1765 growing wild in Georgia on some sandhills along the northeast side of the Altamaha River, within four miles (downstream) of Fort Barrington in what is now known as McIntosh County. Eight years later (1773), William Bartram, the son of John Bartram, revisited the locality and collected ripe seeds from which were grown several plants which flowered in four years. Exactly twenty years after the original discovery the species was described by Humphrey Marshall, a cousin of John Bartram. It is to the plants of William Bartram that all the known specimens of the "Franklin tree" in cultivation today in this country owe their origin.

According to Harper and Leeds (*Bartonia* 19: 1–13, *fig.* 1937), Moses Marshall, a nephew of Humphrey Marshall, was the last known collector to find *Franklinia* in the wild state. This was in 1790. These authors suggest that the attempt to fill large orders of *Franklinia* for a London firm, in 1787 and 1789, by the nursery concern of Humphrey and Moses Marshall may have been the cause of the apparent extermination of the species. There is little doubt that this wholesale collection of a species so closely confined geographically would contribute greatly to its extinction.



It was nearly a hundred years later, in 1880 and 1881, that H. W. Ravenel, at the suggestion of C. S. Sargent, Director of the Arnold Arboretum, made five trips to the type locality of the species. These were followed by other searches, but none of them resulted in the collection of the species. Frequent rumors or reports of its re-discovery have been announced, but usually the discovery turns out to be a collection of *Gordonia Lasianthus* or one of the *Stewartiae*, all close relatives of the species in question.



TEXT-FIGURE II. Original geographical location of *Franklinia alatamaha* Marshall.

Very interesting reading indeed are the two quite recent articles on the history of the genus published by E. T. Wherry (Jour. Washington Acad. Sci. 18: 172-176. 1928) and F. Harper & A. N. Leeds (Bartonia 19: 1-13, fig. 1937). It is from these two papers that this present, very condensed account has been gathered.

For many years the species had been known as *Gordonia pubescens*, and later as *Gordonia "altamaha."* Few authors up to 1925 recorded it technically under *Franklinia*. In that year Melchior in his treatment of the family (Nat. Pflanzenfam. ed. 2, 21: 135. 1925) recognized anew the genus as distinct from *Gordonia*. Since then both Rehder and Bailey have changed their concepts and have accepted the separation.

In its unusual manner of dehiscence the fruit of the Franklin tree is quite distinct from that of all other members of the family known to me. At the apex the capsule splits loculicidally to the center, while from the base it splits septically. The leaves are deciduous and membranaceous. All members of the genus *Gordonia* are coriaceous.

In this country the species is cultivated as far north as Massachusetts. Records show that it is valued equally in the gardens of England, France, and Germany.

### 3. STEWARTIA Linnaeus

*Stewartia* Linnaeus, Sp. Pl. 698. 1753; Gen. Pl. ed. 5, 311, no. 758. 1754. — Szyszyłowicz in Nat. Pflanzenfam. III. 6: 186. 1893.

*Malachodendron* Cavanilles, Monadelph. Diss. 5: 302. 1788.

*Stuartia* L'Heritier, Stirp. Nov. 153. 1791. — Bentham & Hooker f., Gen. Pl. 1: 185. 1862.

*Cavanilla* Salisbury, Prodr. Stirp. Chap. Allert. 385. 1796. Non J. F. Gmelin 1791, nec Thunberg 1795.

TYPE SPECIES: *Stewartia Malachodendron* L.

Flowers hermaphroditic. Sepals 5, imbricate, somewhat unequal, persistent. Petals 5, rarely 6–8, obovate to rounded, crenulate, connate at the base, silky pubescent on the external surface. Stamens numerous; filaments adnate to the base of the corolla, otherwise free or joined at the base in a ring; anthers introrse, versatile, 2-celled, the oblong cells opening longitudinally. Ovary superior, 5-celled; styles 5, distinct or united into one; stigmas 5 or united into a single 5-crenate compound stigma. Capsule woody, 5-celled, loculicidally dehiscent, with or without a persistent columella. Seeds compressed, one to four in each cell, obovate-lenticular, the testa thick and crustaceous, with or without a wing-like margin.

Shrubs or trees with membranaceous and alternate, usually serrulate leaves. Flowers large and showy, axillary, solitary, with one or two bracts below the calyx.

Two very distinct species represent this genus in the United States. Easily distinguished by the style and fruit, they can also be quite accurately distinguished by their geographical distribution.

*Stewartia ovata*, as the accompanying map testifies, prefers the eastern slopes of the Allegheny Mountain range and exhibits its greatest concentration (judged on the basis of herbarium collections) in south-central Tennessee, northern Alabama and Georgia, and is found less abundantly in South and North Carolina. *Stewartia Malachodendron* appears to have been collected less frequently and from scattered localities. The pattern of its distribution follows more closely the coastal range, extending from Virginia through all the coastal states to Louisiana. In only two counties, Cullman Co. in Alabama and Macon Co. in North Carolina, are both species represented by the herbarium material studied here. An interesting note regarding distribution is the fact that this species has been thrice collected in Ouachita Co. in Arkansas.

#### KEY TO THE SPECIES

- A. Styles 5, distinct; seeds reddish brown, dull, not angled, with a narrow membranaceous margin.....*Stewartia ovata*.  
 AA. Styles united, with 5 stigmas; seeds lustrous, angled, lacking an evident margin.....*Stewartia Malachodendron*.

*Stewartia ovata* (Cavanilles) Weatherby in *Rhodora* 41: 193. 1939. — Rehder, *Man. Cult. Trees & Shrubs* ed. 2, 635. 1940; *Bibl. Cult. Trees & Shrubs* 461. 1949. — Bailey, *Man. Cult. Pl.* ed. 2, 673. 1949.

*Malachodendron ovatum* Cavanilles, *Diss. Bot.* 5: 302, *t.* 158, *fig.* 2. 1787. — Michaux, *Fl. Amer.-Bor.* 2: 43. 1803; ed. 2, 43. 1820. — De Candolle, *Prodr.* 1: 528. 1824. — Lindley in Edwards, *Bot. Reg.* 13: *t.* 1104. 1827. — Loudon, *Trees & Shrubs* 71. 1875.

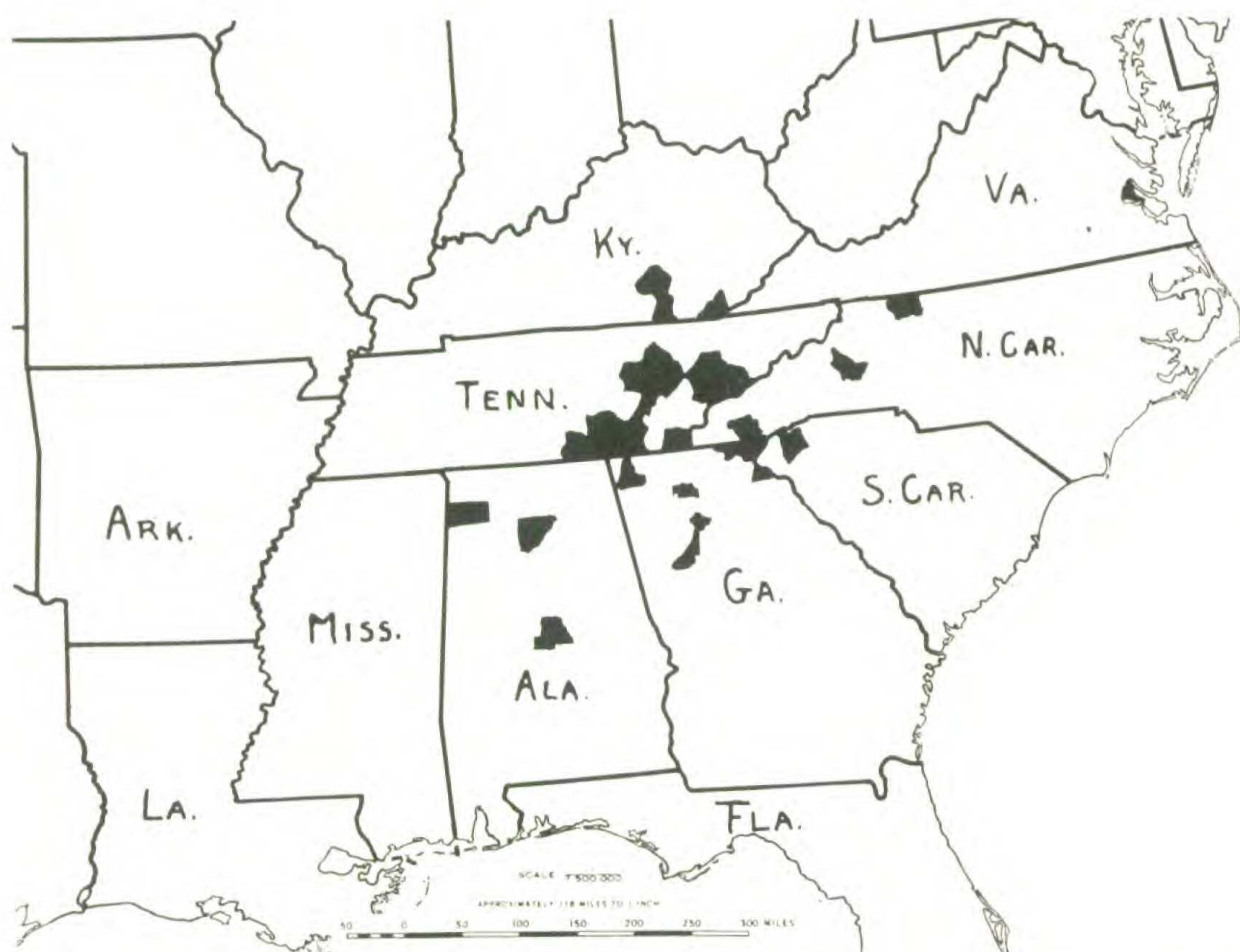
*Stewartia pentagyna* L'Heritier, *Stirp. Nov.* 155, *t.* 74. 1791. — Willdenow, *Spec. Pl.* 3: 840. 1800. — J. E. Smith, *Exot. Bot.* 2: 101, *t.* 110. 1805. — Desfontaines, *Hist. Arb.* 1: 482. 1809. — Pursh, *Fl. Amer. Sept.* 1: 452. 1814. — Nuttall, *Gen. N. Amer. Pl.* 2: 84. 1818. — Elliot, *Sketches Bot.* 2: 173. 1822. — Torrey & Gray, *Fl. N. Amer.* 1: 224. 1838. — Hooker in Curtis's *Bot. Mag.* 68: *t.* 3918. 1842. — Lemaire in *Herb. Gen. Amateur, sér.* 2, 3: *t.* 48. 1845. — Gray, *Gen. Ill.* 2: 100, *t.* 139. 1849. — Darby, *Bot. S. States* 257. 1855. — Choisy in *Mém. Soc. Phys. Hist. Nat. Genève* 14: 137 (*Mém. Ternstr.* 49). 1855. — Chapman, *Fl. South. U. S.* ed. 1, 61. 1860. — Curtis, *Geol. & Nat. Hist. Surv. N. Carol.* 3: 14. 1867. — Watson & Coulter in Gray's *Man. Bot. North. U. S.* ed. 6, 96. 1890. — Nicholson in *Gard.* 43: 173. 1893. — Szyszyłowicz in *Nat. Pflanzenfam.* III. 6: 186. 1893. — Dippel, *Handb. Laubholz.* 3: 30, *fig.* 18. 1893. — Koehne, *Deutsche Dendrol.* 414, *fig.* 60, *d & e.* 1893. — Gray, *Syn. Fl. N. Amer.* 1: 292. 1897. — Lounsberry, *South. Wild Fl. & Trees* 337. 1901. — Keeler, *Our North. Shrubs* 31, *t.* 1903; ed. 2, 1912. — B. in *Fl. & Sylva* 3: 264. 1905. — Robinson & Fernald in Gray's *Man. Bot.* ed. 7, 570. 1908. — Schneider, *Ill. Handb. Laubholz.* 330, *fig.* 220, *a-c.* 1909. — Apgar, *Orn. Shrubs U. S.* 80, *fig.* 50. 1910. — Silva Tarouca, *Freil.-Laubgeh.* 358. 1913. — Bean, *Trees & Shrubs Hardy Brit. Isles* 2: 553. 1914; ed. 3, 1921. — Mathews, *Field Book Amer. Trees & Shrubs* 326, *fig.* 1915. — Rehder in Bailey, *Stand. Cyclop. Hort.* 6: 3241. 1915. — Bailey, *Man. Cult. Pl.* 501. 1924. — Melchior in *Nat. Pflanzenfam.* ed. 2, 21: 134. 1925. — Rehder, *Man. Cult. Trees & Shrubs* 625. 1927.

*Stewartia montana* Bartram, *Travels* 334. 1791; ed. 2, 332. 1792. — Merrill in *Bartonia* 23: 32. 1945.

*Malachodendron pentagynum* (L'Heritier) Dumond-Courset, *Bot. Cult.* ed. 2, 5: 107. 1811. — Small, *Fl. SE U. S.* 793. 1903; ed. 2, 1913; *Man. SE Fl.* 876, *fig.* 1933.

Shrub up to 5 m. high; branchlets terete, gray, reddish in the new growth, quite glabrous even when very young. Leaves deciduous, membranaceous, elliptic to oblong-ovate, 8–12 cm. long, 4–6 cm. wide, rarely as large as 15 × 7 cm., acuminate at the apex, broadly cuneate to rounded at the base, dark green (often tinged with red) and glabrous above, light grayish green and sparingly pubescent beneath, the margin ciliate and remotely serrulate, the veins 5–7 pairs, dark and conspicuous on the under surface, the petiole varying in length, 3–15 mm. long, sparingly pubescent, expanding toward the base. Flowers axillary, solitary; pedicel terete, pubescent, ca. 5 mm. long; bracteoles foliaceous, oblong-ovate, 10–12 mm. long, 5 mm. wide, pubescent, ciliate along the margin; calyx-lobes 5, imbricate, foliaceous, oblong-ovate, up to 20 mm. long, 8 mm. wide, pubescent on

the exterior surface, occasionally sparingly so on the interior surface, ciliate along the margin; petals 5 (occasionally 6), white, obovate, unequal, 2.5–4 cm. long, 2–3 cm. wide, crenulate along the margin; stamens numerous, the filaments glabrous, 18–20 mm. long, yellow, quite free to the base, adnate to the base of the corolla, the anthers orange; ovary globose, densely white-pubescent, ca. 4–5 mm. diam., 5-celled, the styles 5, conspicuous, as long as the stamens, occasionally exceeding them. Capsule ovoid, subligneous, sharply angled, apiculate, pubescent, 5-celled. Seeds reddish brown, dull, ca. 7 mm. long, not angled, with a narrowly winged margin.



TEXT-FIGURE III. Geographical distribution of *Stewartia ovata* (Cav- anilles) Weatherby by counties, based on the herbarium specimens studied.

#### SPECIMENS EXAMINED:

VIRGINIA: JAMES CITY Co.: *L. Arts* 432 (US), *s. n.* (US); *E. J. Grimes* 3818 (G, NY); *E. T. Wherry & F. W. Pennell* 12542 (Mo).

KENTUCKY: BELL Co.: *T. H. Kearney* 322 (AA, Ch, G, Mo, US), 545 (Ch, NY), *s. n.* (Ch); *E. Lucy Braun* 1580 (AA). McCREARY Co.: *F. T. McFarland* 4375 (Mo); *E. L. Braun s. n.* (G, NY). PULASKI Co.: *J. D. Smith s. n.* (G, US).

TENNESSEE: BLOUNT Co.: *A. Moore s. n.* (US); *A. Ruth* 376 (NY), 391 (Mo), 1205 (NY), 2624 (Mo, NY), *s. n.* (Ch, G, Mo, NY, US). CUMBERLAND Co.: *D. M. Coffman* 344 (US); *A. Gattinger* 408 (AA, Ch, G, Mo, NY, US), *s. n.* (AA, Ch, Mo, NY, US). HAMILTON Co.: *A. H. Curtis s. n.* (US). GRUNDY Co.: *H. K. Svenson* 7306 (G). KNOX Co.:

*H. M. Jennison s. n.* (G). MARION Co.: *H. K. Svenson 8913* (G). MORGAN Co.: *A. S. Percival s. n.* (Ch). POLK Co.: *Biltmore Herb. 886<sup>c</sup>* (AA, G, NY, US); *A. Gattinger s. n.* (G). RHEA Co.: *Biltmore Herb. 886<sup>b</sup>* (NY, US); *D. M. Coffmann s. n.* (AA, US). ROANE Co.: *D. White s. n.* (Mo, US). SEQUATCHIE Co.: *J. H. H. Boyd s. n.* (AA). SEVIER Co.: *L. Barksdale s. n.* (NY); *W. H. Camp 1744* (NY); *H. M. Jennison & J. C. Smith 968* (Ch, G, Mo, NY, US); *C. S. Sargent s. n.* (AA); *J. K. Underwood, L. R. Hassler & A. J. Sharp* (Mo). PRECISE LOCALITY LACKING: *T. F. Allen s. n.* (NY); *A. Gattinger s. n.* (AA, NY, US); *F. Lamson-Scribner s. n.* (NY); *S. Price s. n.* (Mo); *F. Rugel s. n.* (NY); *G. B. Sudworth s. n.* (US).

NORTH CAROLINA: BURKE Co.: (*M.*) *G. McCarthy s. n.* (NY). MACON Co.: *Biltmore Herb. 886* (Ch, Mo, NY, US), *886<sup>b</sup>* (AA, Ch, G, Mo, NY, US); *C. L. Boynton s. n.* (Mo); *T. G. Harbison s. n.* (G); *L. Stewart s. n.* (NY); *E. H. White s. n.* (NY). SURRY Co.: *Biltmore Herb. 886<sup>g</sup>* (NY, US). PRECISE LOCALITY LACKING: *J. Carey s. n.* (NY); *C. S. Sargent s. n.* (AA).

SOUTH CAROLINA: PRECISE LOCALITY LACKING: *F. E. Boyton s. n.* (US).

GEORGIA: FULTON Co.: *E. T. Wherry s. n.* (AA). PICKENS Co.: *Biltmore Herb. 886<sup>f</sup>* (US). RABUN Co.: *E. J. Alexander, T. H. Everett & S. D. Pearson s. n.* (NY); *T. G. Harbison 52* (AA); *J. H. Pyron & R. McVaugh 806* (US); *D. Samson s. n.* (NY); *J. K. Small s. n.* (AA, Ch, G, Mo, NY, US). STEPHENS Co.: *T. G. Harbison 10* (AA). TOWNS Co.: *C. S. Sargent s. n.* (AA). WALKER Co.: *J. D. Smith s. n.* (US). WHITE Co.: *W. W. Ashe s. n.* (Mo). PRECISE LOCALITY LACKING: *S. B. Buckley s. n.* (G, Mo); *C. Wright s. n.* (G).

ALABAMA: CHILTON Co.: *Biltmore Herb. 886<sup>e</sup>* (US); *T. G. Harbison s. n.* (AA). FRANKLIN Co.: *R. M. Harper 3398* (AA, G, Mo, US); *L. James 29* (Mo). CULLMAN Co.: *H. Eggert s. n.* (Mo, NY, US); *C. Mohr* (US); *G. B. Sudworth s. n.* (US); *W. Wolf s. n.* (Ch, G, US). PRECISE LOCALITY LACKING: *S. B. Buckley s. n.* (NY).

***Stewartia ovata* (Cavanilles) Weatherby var. *grandiflora* (Bean)**  
Weatherby in *Rhodora* 41: 193. 1939. — Rehder, *Man. Cult. Trees & Shrubs* ed. 2, 635. 1940; *Bibl. Cult. Trees & Shrubs* 461. 1949. — Bailey, *Man. Cult. Pl.* ed. 2, 673. 1949.

*Stewartia pentagyna* L'Heritier var. *grandiflora* Bean, *Trees & Shrubs Hardy Brit. Isles* 2: 555. 1914; ed. 3, 1921. — Rehder in Bailey, *Stand. Cyclop. Hort.* 6: 3241. 1915; *Man. Cult. Trees & Shrubs* 625. 1927.

*Malachodendron pentagynum* (L'Heritier) Dumond-Courset var. *grandiflorum* (Bean) Alexander in *Brittonia* 19: 1, t. 609. 1935.

In separating this variety, W. J. Bean signified that the flowers were larger than those of the species and that the stamens were purple. Actually the size of the flower varies very little between the species and the variety, especially in the wild. The filaments of the variety are purple, while those of the species are yellow. In both, the anthers are yellow.

No specimens of this variety have been cited in this study. Most specimens, when dried, present a distinct golden color in the filaments, in no way to be interpreted as purple. However, some of the poorer specimens

show the filaments dark in color — in most instances due to poor drying.

*L. Artz 432* in the U. S. National Herbarium bears the only record of the finding of this variety in the wild. Miss Artz, whose specimen was collected near Williamsburg, Virginia, states: "Two forms. The plant with dark red color in leaves bears purple-stamened blossoms, the other, yellow-stamened blossoms." Miss Artz's specimen, however, is in fruit. A very fine color illustration may be found in *Addisonia* 19: 1, *pl.* 609. 1935.

*Stewartia Malachodendron* Linnaeus, *Spec. Pl.* 698. 1753; ed. 2, 982. 1762. — Buc'hoz [Buchoz], *Pl. Nouv. Découv.* 18, *t.* 16. 1779 — Walter, *Fl. Carol.* 175. 1788. — L'Heritier, *Stirp. Nov.* 153, *t.* 73. 1791. — Willdenow, *Spec. Pl.* 3: 840. 1800. — Desfontaines, *Hist. Arb.* 1: 482. 1809. — Torrey & Gray, *Fl. N. Amer.* 1: 224. 1838. — Carrière in *Rev. Hort.* 1878: 70, *t.* 1878. — Szyszyłowicz in *Nat. Pflanzenfam.* III. 6: 186, *fig.* 94. 1893. — Gray, *Syn. Fl. N. Amer.* 1: 292. 1897. — Lounsberry, *South. Wild Fl. & Trees* 338. 1901. — Small, *Fl. SE U. S.* 793. 1903; ed. 2, 1913. — Hemsley in *Curtis's Bot. Mag.* 133: *t.* 8145. 1907. — Anon. in *Gard. Chron.*, ser. 3, 42: 32, *fig. p.* 27. 1907; 44: 132, *fig.* 52. 1908. — Robinson & Fernald in *Gray's Man. Bot.* ed. 7, 570. 1908. — Apgar, *Orn. Shrubs U. S.* 80. 1910. — Bean, *Trees & Shrubs Hardy Brit. Isles* 553, *fig.* 1914: ed. 3, 1921. — Mathews, *Field Book Amer. Trees & Shrubs* 326, *fig.* 1915. — Rehder in *Bailey, Stand. Cyclop. Hort.* 6: 3241. 1915. — Bailey, *Man. Cult. Pl.* 501. 1924; ed. 2, 674. 1949. — Melchior in *Nat. Pflanzenfam.* ed. 2, 21: 134, *fig.* 62. 1925. — Rehder, *Man. Cult. Trees & Shrubs* 624. 1927; ed. 2, 634. 1940; *Bibl. Cult. Trees & Shrubs* 461. 1949. — Small, *Man. SE Fl.* 876, *fig.* 1933. — Fernald in *Gray's Man. Bot.* ed. 8, 1007. 1950.

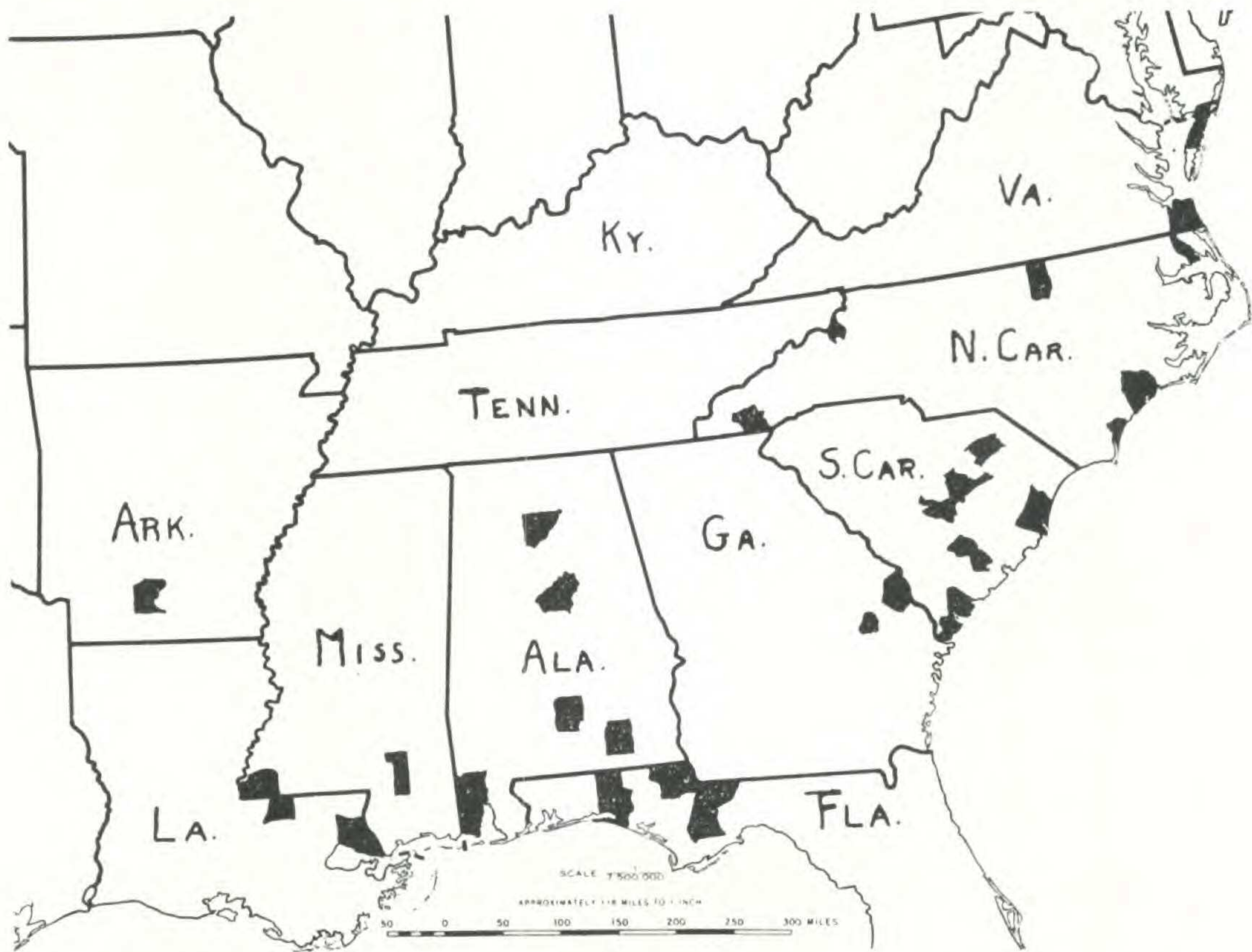
*Stewartia virginica* Cavanilles, *Diss. Bot.* 5: 303, *t.* 159, *fig.* 2. 1787. — Lamarck, *Ill.* 3: *t.* 594. 1797. — Michaux, *Fl. Amer.-Bor.* 2: 42. 1803; ed. 2, 2: 42. 1820. — Lamarck, *Encycl. Meth. Bot.* 7: 441. 1806. — Pursh, *Fl. Amer. Sept.* 1: 451. 1814. — Nuttall, *Gen. N. Amer. Pl.* 2: 84. 1818. — Elliot, *Sketches Bot.* 2: 172. 1822. — De Candolle, *Prodr.* 1: 528. 1824. — G. Don, *Gen. Syst.* 1: 573. 1831. — J. C. Loudon, *Arb. & Fruct. Brit.* 1: 378, *fig.* 92. 1838. — Gray, *Gen. Ill.* 2: 99, *t.* 138. 1849. — Darby, *Bot. S. States* 257. 1855. — Choisy in *Mém. Soc. Phys. Hist. Nat. Genève* 14: 136 (*Mém. Ternstr.* 48). 1855. — Chapman, *Fl. South. U. S.* ed. 1, 61. 1860. — Curtis, *Geol. & Nat. Hist. Surv. N. Carol.* 3: 14. 1867. — Loudon, *Trees & Shrubs* 72, *fig.* 108, 109. 1875. — Anon. in *Gard. Chron.* n. ser. 8: 443. 1877. — Anon. in *Gard.* 12: 595, *fig.* 1877. — Hemsley in *Gard.* 14: 38, *t.* 1878. — W. G. in *Gard.* 18: 628, *fig.* 1880. — T. in *Gard.* 26: 143, *fig.* 1884. — Goldring in *Gard.* 34: 280. 1888. — Watson & Coulter in *Gray's Man. Bot. North. U. S.* ed. 6, 96. 1890. — Dippel, *Handb. Laubholz.* 3: 27, *fig.* 15. 1893. — Anon. in *Fl. & Sylva* 1: 73. 1903. — B. in *Fl. & Sylva* 3: 265, *fig.* 1905.

*Cavanilla florida* Salisbury, *Prodr. Stirp. Chap. Allert.* 385. 1796.

*Stuartia nobilis* Salisbury, *Prodr. Stirp. Chap. Allert.* 386. 1796.

*Malachodendron monogyneum* Dumond-Courset, *Bot. Cult.* ed. 2, 5: 106. 1811.

Shrub or tree-like shrub up to 7 m. high, the branchlets terete, slender, gray, pubescent when very young. Leaves deciduous, membranaceous, elliptic to oblong-elliptic, 7–11 cm. long, 3–5 cm. wide, acute or shortly acuminate at the apex, cuneate at the base, tapering into a short pubescent petiole ca. 0.5 cm. long, dark green and glabrous above, light green and pubescent beneath, the margin ciliate and serrulate, each serrulation with



TEXT-FIGURE IV. Geographical distribution of *Stewartia Malachodendron* Linnaeus by counties, based on the herbarium specimens studied.

a minute tooth, the veins 7–8 pairs, elevated and conspicuous on the under surface, lightly depressed on the upper surface. Flowers solitary, axillary, usually near the end of the branchlet, large, as much as 10 cm. across; pedicel short, stout, 5 mm. or less long, pubescent; bracteoles 2, ovate, opposite, immediately below calyx, pubescent; calyx-lobes 5, imbricate, unequal, ovate, acute-tipped, ca. 1 cm. or less long, pubescent, ciliate along the margin; petals 5, obovate, white or yellow, silky on the exterior surface, 3–4.5 cm. long, 2.5–3 cm. wide, crenulate along the margin; stamens numerous, the filaments joined at the base in a ring, otherwise free, unequal, 8–10 mm. long, the anthers bluish in color; ovary ovoid, ca. 5 mm. diam., densely pubescent, 5-celled, styles united appearing as one, glabrous, the stigma 5-lobed. Capsule woody, loculicidally dehiscent into 5 valves, quite globose, occasionally conical at the apex, pubescent; seeds dark, lustrous, ca. 7 mm. long, ca. 4 mm. wide, three-sided, wingless.

## SPECIMENS EXAMINED:

VIRGINIA: ACCOMAC Co.: *E. Mears s. n.* (G, NY). NORFOLK Co.: *M. L. Fernald & B. Long 11078* (G), *12131* (G); *M. L. Fernald & L. Griscom 4455* (AA, G). PRINCESS ANNE Co.: *M. L. Fernald & B. Long 10726* (Ch, G, Mo, US); *M. L. Leigh s. n.* (G); *K. K. MacKenzie s. n.*

NORTH CAROLINA: AVERY Co.: *Kelsey s. n.* (Mo). GRANVILLE Co.: (*M.*) *G. McCarthy s. n.* (US). NEW HANOVER Co.: *S. W. Noble s. n.* (US). ONSLOW Co.: *H. Moldenke 1246a* (Mo, NY). PASQUOTANK Co.: *K. M. Wiegand & W. E. Manning 1977* (G). PRECISE LOCALITY LACKING: *M. A. Curtis s. n.* (Mo); *Loomis s. n.* (NY).

SOUTH CAROLINA: BEAUFORT Co.: *J. H. Mellichamp s. n.* (AA). CALHOUN Co.: *Biltmore Herb. 886<sup>d</sup>* (US). DARLINGTON Co.: *E. J. Palmer 42378* (AA). DORCHESTER Co.: *J. H. Mellichamp s. n.* (AA); *J. B. s. n.* (US). GEORGETOWN Co.: *T. G. Harbison s. n.* (AA). SUMTER Co.: *M. M. Childs s. n.* (US).

GEORGIA: CANDLER Co.: *W. H. & M. B. Duncan 3964* (G, US); *E. T. Wherry s. n.* (G). SCREVEN Co.: *D. Eyles 6936* (G). PRECISE LOCALITY LACKING: *A. Gray s. n.* (NY); *T. G. Harbison 1150* (AA).

FLORIDA: GADSDEN Co.: *A. W. Chapman s. n.* (Mo, NY). JACKSON Co.: *T. G. Harbison 13* (AA). LIBERTY Co.: *E. J. Palmer 38546* (AA, NY, US). WALTON Co.: *E. J. Palmer 38605* (AA, Mo); *J. K. Small, C. A. Mosier & P. A. Mathaus s. n.* (NY). PRECISE LOCALITY LACKING: *W. Baldwin s. n.* (Ch, G, Mo); *A. W. Chapman s. n.* (G).

ALABAMA: BUTLER Co.: *R. M. Harper 98* (G, Mo, NY, US). COFFEE Co.: *Biltmore Herb. 4667<sup>c</sup>* (US). CULLMAN Co.: *Biltmore Herb. 4667<sup>d</sup>* (US); *C. Mohr s. n.* (US). MOBILE Co.: *C. Mohr s. n.* (Ch). SHELBY Co.: *M. M. Everts 407* (NY). TUSCALOOSA Co.: *E. A. Smith s. n.* (AA). PRECISE LOCALITY LACKING: *C. W. Short s. n.* (NY).

MISSISSIPPI: FORREST Co.: *T. G. Harbison 10* (AA). WILKINSON Co.: *I. S. B. s. n.* (Ch). PRECISE LOCALITY LACKING: *E. Hilgard* in 1858 (Mo), 1859 (Mo) and 1867 (Mo); *C. Koch s. n.* (US).

LOUISIANA: EAST FELICIANA Co.: *S. B. Buckley s. n.* (Mo). ST. TAMMANY Co.: *R. S. Cocks s. n.* (AA). PRECISE LOCALITY LACKING: *W. M. Carpenter s. n.* (Ch, G); *J. Hale s. n.* (G); *S. T. Olney s. n.* (G).

ARKANSAS: OUACHITA Co.: *A. Fendler s. n.*, May 11, 1850, (Mo), May 19, 1850 (G).

ARNOLD ARBORETUM,

HARVARD UNIVERSITY.